

## ELLIOT ANSHELEVICH

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### Research Interests

My interests center on the design and analysis of algorithms. I am especially interested in algorithms for large decentralized networks, including networks involving strategic agents. In particular, I am interested in:

- Strategic agents in networks, and influencing their behavior
- Network design problems
- Influence, disease, and information propagation in both social and computer networks
- Dynamic flow and network flow over time
- Local and decentralized routing algorithms

### Education

Cornell University, Ithaca, New York, 2000-2005  
Ph.D. Computer Science, August 2005  
Thesis title: Design and Management of Networks with Strategic Agents  
Advisor: Jon Kleinberg  
Master of Science, May 2004

Rice University, Houston, Texas, 1996-2000  
B.S. Computer Science, May 2000  
Double major in Computer Science and Mathematics  
*magna cum laude*

### Professional and Research Experience

RENSSELAER POLYTECHNIC INSTITUTE, TROY, NEW YORK 2006-  
Started as an Assistant Professor in August 2006.

PRINCETON UNIVERSITY, PRINCETON, NEW JERSEY 2005-2006  
Postdoc with Moses Charikar. This work was supported by the NSF Mathematical Postdoctoral Research Fellowship.

LUCENT TECHNOLOGIES, MURRAY HILL, NEW JERSEY Summer 2004  
Research on game theoretic network design with Gordon Wilfong and Bruce Shepherd.

LUCENT TECHNOLOGIES, MURRAY HILL, NEW JERSEY Summer 2003  
Internship working on optical network design at Bell Labs, under supervision of Lisa Zhang.

## Publications in Journals and Peer-Reviewed Conferences

- Elliot Anshelevich, Deeparnab Chakrabarty, Ameya Hate, and Chaitanya Swamy. “Approximations for the FireFighter Problem: Cuts over Time and Submodularity.” Submitted.
- Elliot Anshelevich and Bugra Caskurlu. “Exact and Approximate Equilibria for Optimal Group Network Formation.” To appear in *European Symposium on Algorithms (ESA)*, 2009.
- Elliot Anshelevich, Sanmay Das, and Yonatan Naamad. “Anarchy, Stability, and Utopia: Creating Better Matchings.” To appear in *International Symposium on Algorithmic Game Theory (SAGT)*, 2009.
- Elliot Anshelevich and Satish Ukkusuri. “Equilibria in Dynamic Selfish Routing.” To appear in *International Symposium on Algorithmic Game Theory (SAGT)*, 2009.
- Elliot Anshelevich and Bugra Caskurlu. “Price of Stability in Survivable Network Design.” To appear in *International Symposium on Algorithmic Game Theory (SAGT)*, 2009.
- Elliot Anshelevich and Gordon Wilfong. “Network Formation and Routing by Strategic Agents using Local Contracts.” In *Proc. 4th International Workshop On Internet And Network Economics (WINE)*, 2008.
- Dahai Xu, Elliot Anshelevich, and Mung Chiang. “On Survivable Access Network Design: Complexity and Algorithms.” In *Proc. 27th Conference on Computer Communications (INFOCOM 2008)*.
- Elliot Anshelevich and Adriana Karagiozova. “Terminal Backup, 3D Matching, and Covering Cubic Graphs.” In *Proc. 39th ACM Symposium on Theory of Computing (STOC 2007)*.
- Elliot Anshelevich, Anirban Dasgupta, Eva Tardos, and Tom Wexler. “Near-Optimal Network Design with Selfish Agents.” In *Theory of Computing*, Volume 4 (2008), pp. 77-109. Conference version appeared in *Proc. 35th ACM Symposium on Theory of Computing (STOC 2003)*.
- Elliot Anshelevich, Anirban Dasgupta, Jon Kleinberg, Éva Tardos, Tom Wexler, and Tim Roughgarden. “The Price of Stability for Network Design with Fair Cost Allocation.” *SIAM Journal on Computing*, Volume 38, Issue 4 (November 2008), pp. 1602-1623. Conference version appeared in *Proc. 45th Annual IEEE Symposium on Foundations of Computer Science (FOCS 2004)*.
- Elliot Anshelevich and Lisa Zhang. “Path Decomposition under a New Cost Measure with Applications to Optical Network Design.” *ACM Transactions on Algorithms*, Volume 4, Issue 1 (March 2008). Conference version appeared in *Proc. 12th Annual European Symposium on Algorithms (ESA 2004)*.
- Elliot Anshelevich, David Kempe, and Jon Kleinberg. “Stability of Load Balancing Algorithms in Dynamic Adversarial Systems.” *SIAM Journal on Computing*, Volume 37, Issue 5 (January 2008), pp. 1656-1673. Conference version appeared in *Proc. 34th ACM Symposium on Theory of Computing (STOC 2002)*.

- Elliot Anshelevich, Bruce Shepherd, Gordon Wilfong. “Strategic Network Formation through Peering and Service Agreements.” In *Proc. 47th Annual IEEE Symposium on Foundations of Computer Science (FOCS 2006)*. (Older title: “Local Peering and Service Contracts in Strategic Network Formation.”)
- Elliot Anshelevich, Scott Owens, Florent Lamiroux, and Lydia Kavraki. “Deformable Volumes in Path Planning Applications.” In *Proc. IEEE International Conference on Robotics and Automation*, 2000, pp. 2290–2295.

## Invited and Contributed Talks

“Exact and Approximate Equilibria for Optimal Group Network Formation.”

- CORS-INFORMS International Meeting, Toronto, Canada, June 2009.
- Bellairs Workshop on Algorithmic Game Theory, Barbados, March 2009.

“Network Formation and Routing by Strategic Agents using Local Contracts.”

- 4th International Workshop On Internet And Network Economics (WINE 2008). Shanghai, China, December 2008.

“Terminal Backup, 3D Matching and Covering Cubic Graphs.”

- Computer Science Colloquium, Williams College, Williamstown, MA, May 2009.
- Carnegie Mellon University Theory Seminar, CMU, Pittsburgh, PA, February 2009.
- Tutte Seminar, Dept. of Combinatorics & Optimization, University of Waterloo, ON, Canada, November 2008.
- Brown University Theory Lunch, Providence, RI, Oct 2008.
- CSAIL Algorithms and Complexity Seminar, MIT, Cambridge, MA, Oct 2008.
- AT&T Shannon Research Laboratory, Florham Park, NJ, Sep 2008.
- Bell Labs Computing Sciences Research Seminar. Murray Hill, NJ, Sep 2008
- Dartmouth Theory Seminar. Hanover, NH, May 2008.
- Columbia University Theory Seminar. New York, NY, November 2007.
- 39th ACM Symposium on Theory of Computing (STOC 2007). San Diego, CA, June 2007.

“The Price of Stability for Network Design.”

- USC Computer Science Colloquium. Los Angeles, CA, October 2007.
- Yale Discrete Mathematics and Theoretical Computer Science Seminar. New Haven, Connecticut, April 2006.
- UPenn Computer Science Theory Seminar. Philadelphia, Pennsylvania, October 2005.
- Princeton University Theory Lunch. Princeton, New Jersey, September 2005.
- University of Minnesota Computer Science Colloquium. Twin Cities, Minnesota, April 2005.
- Rensselaer Polytechnic Institute Computer Science Colloquium. Troy, New York, April 2005.

- Northwestern University Computer Science Lecture Series. Evanston, Illinois, March 2005.
- DIMACS Theoretical Computer Science Seminar. New Brunswick, New Jersey, November 2004.
- IBM Watson Mathematics Seminar. Yorktown Heights, New York, August 2004.

“Epidemiology and Graph Cuts.”

- Dagstuhl Seminar on Probabilistic Methods in the Design and Analysis of Algorithms. Dagstuhl, Germany, September 2007.

“Strategic Network Formation through Peering and Service Agreements.”

- Georgia Tech/Dimacs Workshop on Complex Networks and Systems. Atlanta, GA, January 2007.
- Northeastern University CCIS Colloquium. Boston, MA, November 2006.
- Cornell University Computer Science Theory Seminar. Ithaca, NY, October 2006.
- 47th Annual IEEE Symposium on Foundations of Computer Science (FOCS). Berkeley, CA, 2006.
- Workshop on Network Design: Optimization and Algorithmic Game Theory. Montréal, Québec, Canada, August 2006.
- INFORMS Annual Meeting, 2005. San Francisco, California, November 2005.

“Path Decomposition Under a New Cost Measure with Applications to Optical Network Design.”

- European Symposium on Algorithms (ESA). Bergen, Norway, September 2004.

“The Price of Stability for Network Design with Fair Cost Allocation.”

- 1st Bertinoro Workshop on Algorithmic Game Theory (AGATE 2004). Bertinoro, Italy, June 2004.

“Near-Optimal Network Design with Selfish Agents.”

- Bell Labs Computing Sciences Research Seminar. Murray Hill, New Jersey, June 2003.
- ACM Symposium on Theory of Computing (STOC). San Diego, California, June 2003.

“Stability of Load Balancing Algorithms in Dynamic Adversarial Systems”.

- ACM Symposium on Theory of Computing (STOC). Montréal, Québec, Canada, May 2002.

“Deformable Volumes in Path Planning Applications.”

- IEEE International Conference on Robotics and Automation, 2000. San Francisco, California, April 2000.

## Teaching Experience

CSCI-6963: Algorithmic Game Theory. Spring 2009 at RPI.

CSCI-4020: Computer Algorithms. Spring 2007, 2008, 2009 at RPI.

CSCI-6964: Advanced Algorithm Design. Fall 2006 and 2007 at RPI.

Undergraduate Research Supervisor: Yonatan Naamad, Summer 2008.

## Professional Activities

Societies member: SIGACT, INFORMS, EATCS

Organizing a new Theory Seminar, Computer Science Dept., RPI, 2007-2009.

*PC Member:*

AMMA 2009: Conference on Auctions, Market Mechanisms, and their Applications

IPDPS 2010: IEEE International Parallel and Distributed Processing Symposium

Organized the Theory Discussion Group, Department of Computer Science, Cornell University, 2002.

Served as a Mentor in the Cornell Department of Computer Science First-year Mentorship program, 2001-2003.

*Referee:* NSF Panelist, SIAM Journal on Computing, Theory of Computing Systems, Games and Economic Behavior, Transactions on Algorithms (TALG), Theoretical Computer Science, Mathematics of Operations Research, Networks, Algorithmica, Journal of Artificial Intelligence Research (JAIR), IEEE Symposium on Foundations of Computer Science (FOCS), ACM-SIAM Symposium on Discrete Algorithms (SODA), Symposium on Theoretical Aspects of Computer Science (STACS), Integer Programming and Combinatorial Optimization (IPCO), Conference On Principles Of Distributed Systems, International Colloquium on Automata, Languages and Programming (ICALP), ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), Conference on Computer Communications (INFOCOM), International Symposium on Algorithms and Computation (ISAAC), Workshop on Approximation and Online Algorithms (WAOA), ACM Symposium on Theory of Computing (STOC), and others.

## Honors and Awards

Awarded single-PI NSF grant titled “Influencing and Improving Networks Formed by Strategic Agents”, amount \$270,000

NSF Mathematical Sciences Postdoctoral Research Fellowship, 2005-2008

Excellent TA Award, Cornell Department of Computer Science, Spring 2004

National Science Foundation Graduate Fellowship, 2000-2003

## Citizenship Status

U.S. Citizen

## References

Available upon request